

STATE OF CALIFORNIA
STANDARD AGREEMENT
 STD 213 (Rev 06/03)

AGREEMENT NUMBER 15-C0055
REGISTRATION NUMBER 1446258

1. This Agreement is entered into between the State Agency and the Contractor named below:
- STATE AGENCY'S NAME
Department of Pesticide Regulation
- CONTRACTOR'S NAME
The Regents of the University of California
2. The term of this Agreement is: October 1, 2015 or upon final approval by the State, whichever occurs later, through July 31, 2018
3. The maximum amount of this Agreement is: **\$ 146,404.00**
One hundred forty-six thousand four hundred four dollars and no cents

4. The parties agree to comply with the terms and conditions of the following exhibits which are by this reference made a part of the Agreement.
- | | |
|--|---------|
| Exhibit A – Scope of Work | 5 Pages |
| Exhibit B – Budget Detail and Payment Provisions | 2 Pages |
| Exhibit C* – General Terms and Conditions (GIA 610) | |
| Exhibit D - Special Terms and Conditions | 2 Pages |
| Exhibit E – Additional Terms and Conditions | 1 Page |
| Exhibit F – Resume for Principal Investigator | 2 Pages |
| Attachment 1 – Detailed Budget | 1 Page |

Items shown with an Asterisk (*), are hereby incorporated by reference and made part of this agreement as if attached hereto. *These documents can be viewed at <http://www.dgs.ca.gov/ols/Resources/StandardContractLanguage.aspx>*

IN WITNESS WHEREOF, this Agreement has been executed by the parties hereto.

CONTRACTOR	
CONTRACTOR'S NAME (if other than an individual, state whether a corporation, partnership, etc.) The Regents of the University of California	
BY (Authorized Signature) 	DATE SIGNED(Do not type) 9/17/15
PRINTED NAME AND TITLE OF PERSON SIGNING Ahmad Hakim-Elahi, Ph.D., J.D.; Executive Director, Research Administration	
ADDRESS Office of Research, Sponsored Programs 1850 Research Park Drive, Suite 300, Davis, CA 95618	
STATE OF CALIFORNIA	
AGENCY NAME Department of Pesticide Regulation	
BY (Authorized Signature) 	DATE SIGNED(Do not type) 9-28-15
PRINTED NAME AND TITLE OF PERSON SIGNING Lu Saepanh, Fiscal Services and Business Operations Branch Chief	
ADDRESS 1001 I Street, Sacramento, CA 95814	

California Department of General Services Use Only

CJG

APPROVED

OCT 1 - 2015

OFFICE OF LEGAL SERVICES
DEPT. OF GENERAL SERVICES

Exempt per:
~~Delegation Letter 74.5~~



EXHIBIT A
STANDARD AGREEMENT

- D. All administrative communications, except payments, from DPR to Contractor shall be directed to:

Office of Research, Sponsored Programs
1850 Research Park Drive Ste. 300
Davis, CA 95618

Phone: 530-754-7700; FAX: 530-754-8229
Email Address: awards@ucdavis.edu

- E. All payments from DPR to the Contractor shall be directed to:

Cashier's Office
P.O. Box 989062
West Sacramento, CA 95798-9062

- F. The Project Representatives during the term of this Agreement may be changed by mutual written agreement without the necessity of formal amendment to this Agreement.

4. Background and Goals

The Department of Pesticide Regulation has collected scores of environmental data, for example pesticide concentrations recorded in the Surface Water Database. The measurements have been collected over time, space and sampling techniques, including irregularly spaced observations due to missing data and different sampling frequency. The dataset also contains a large number of samples whose concentration is below the reporting limit of analytical instruments. The main problem arising with this complex data is the extraction of a coherent signal that shows the temporal and spatial trends of pesticide concentration in surface water. The key research questions are: (1) how to estimate summary statistics (e.g., mean, maximum, percentiles, and distribution) of pesticide residues given the above conditions, (2) what are the best sampling locations and frequencies for surface water monitoring in California, and (3) how chemical properties and environmental factors affect the pesticide concentration in the environment.

5. Objectives

The objectives are to:

- A. Develop statistical methodology that can estimate pesticide concentration for the surface water database initially impeded by data gaps and uneven monitoring schedules; and,
- B. Produce novel statistical data analysis tools that can utilize the estimated concentration to support applications within the DPR.

EXHIBIT A
STANDARD AGREEMENT

6. Work to Be Performed

- A. Provide quarterly reports on study progress to DPR.
- B. Task 1 -
Conduct initial data analysis - In the first phase of the project, an extensive data analysis will take place to extract the core information inherent in the data and to identify promising routes for the modeling part. Relevant data summaries will be provided.
- C. Task 2 -
Develop a modeling framework - The second phase will develop the statistical methodology for the assessment of the monitoring data. The knowledge gained in the first phase will guide this development. Primary interest will be in introducing new spatial temporal models capable of handling irregularly spaced time series data. The models will be validated on part of the data from the Surface Water Database.
- D. Task 3 -
Develop recommended procedures - The third phase of the project is concerned with the fine-tuning of the proposed models and the development of recommended procedures for application within the DPR regarding the severity of a pesticide's contamination and the effectiveness of regulatory measures. All findings will be given in a final technical report.
- E. Task 4 -
Prepare Manuscript for submission to leading peer-reviewed technical journals.
- F. Task 5 -
Present Seminar to DPR on research findings.
- G. Task 6 -
Prepare Final Report for submission to DPR.

7. Deliverables

The contractor will deliver to DPR:

- A. Quarterly reports by email to DPR's Contract Manager;
- B. Task 1 -
A technical memorandum summarizing the input data and results of the initial data analysis will be submitted to DPR's Contract Manager via email on or before March 31, 2016;

**EXHIBIT A
STANDARD AGREEMENT**

C. Task 2 –

A technical memorandum summarizing the development of a modeling framework will be prepared and submitted to DPR’s Contract Manager via email on or before September 30, 2017;

D. Task 3 –

A technical memorandum outlining recommended procedures for use within DPR will be submitted to DPR’s Contract Manager via email on or before June 30, 2018;

E. Task 4 –

A manuscript will be prepared for submission to a leading peer-reviewed technical journal. The manuscript will summarize the findings of Tasks 1 to 3 (Deliverables B. to D.). The manuscript will be emailed to DPR’s Contract Manager no less than 30 days prior to submission and not later than August 31, 2018;

F. Task 5 –

Present one seminar to DPR, toward the end of the project, on the findings of the conducted research; and,

G. Task 6 - Based on the manuscript in E., prepare a final technical report of the study and submit to DPR 6 weeks before completion of the contract.

8. Project Timeline

Task	2015	2016				2017				2018		
	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
1. Initial data analysis	■	■										
2. Modeling framework			■	■	■	■	■	■				
3. Recommended procedures									■	■	■	
4. Manuscript												■
5. Seminar												■
6. Final report												■

9. DPR Responsibilities

A. DPR will participate, as needed, in Tasks 1 to 3 of the project.

EXHIBIT A
STANDARD AGREEMENT

- B. DPR will review the final technical report prepared under Task 4 and will provide comments within 3 weeks of submission.
-

EXHIBIT B
Standard Agreement

BUDGET DETAIL AND PAYMENT PROVISIONS

1. Invoicing

- A. Upon receipt and approval of invoices by the Contract Manager for services performed according to the attached Scope of Work and the terms of this Agreement, DPR agrees to compensate Contractor, in arrears, for actual allowable costs incurred as specified herein and in accordance with the rates specified herein or attached hereto. Incomplete or disputed invoices shall be returned to Contractor, unpaid, for correction.
- B. Invoices will include the Agreement Number, and will be itemized in accordance with the Rates in this Exhibit, and will be submitted in triplicate, not more frequently than monthly or less than quarterly in arrears, to:

Department of Pesticide Regulation
Attn: Accounts Payable
P.O. Box 4015, MS-4A
Sacramento, CA 95812-4015

2. Budget Contingency Clause

- A. It is mutually agreed that if the Budget Act of the current year and/or any subsequent years covered under this Agreement does not appropriate sufficient funds for the program, this Agreement shall be of no further force and effect. In this event, DPR shall have no liability to pay any funds whatsoever to Contractor or to furnish any other considerations under this Agreement and Contractor shall not be obligated to perform any provisions of this Agreement.
- B. If funding for any fiscal year is reduced or deleted by the Budget Act for purposes of this program, DPR shall have the option to either cancel this Agreement with no liability occurring to DPR, or offer an Agreement Amendment to Contractor to reflect the reduced amount.

3. Payment

- A. Costs for this Agreement shall be computed in accordance with State Administrative Manual (SAM) Sections 8752 and 8752.1.
- B. Nothing herein contained shall preclude advance payments pursuant to Article 1, Chapter 3, Part 1, Division 3, Title 2 of the California Government Code, Sections 11256 and 11257.
- C. Transportation and subsistence costs shall not exceed rates authorized to be paid UC system non-represented employees traveling within California.

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Standard Agreement

- D. Contractor will be reimbursed for direct costs, other than salary costs, that are identified in the Contractor's rates.
- E. Contractor will bill in arrears for costs incurred during the billing period. If applicable, salary costs will be itemized and billed by position. Documentation supporting specific salary costs will be presented if requested by DPR. Non-wage costs will be billed, in summary, according to general expense categories. A detailed report of transactions will support the billing. Individual expenditures exceeding \$500.00 will be supported by a photocopy of the original documentation. Documentation in support of expenditures less than \$500.00 will be presented if requested by DPR.
- F. Contractor shall not commence performance of work or services until this Agreement has been approved by the State. No payment will be made prior to approval nor for any work performed prior to approval of this Agreement.
- G. Ten percent (10%) of each invoice amount shall be withheld by DPR until the satisfactory completion of this Agreement

4. Rates

The rates for services are detailed in Attachment 1 of this Agreement.

5. Cost Limitation

- A. The total amount of this Agreement shall not exceed \$146,404.00.
- B. It is understood and agreed that this total is an estimate and that DPR will pay for only those services actually rendered as authorized by the DPR Contract Manager or his/her designee.

EXHIBIT D
Standard Agreement

SPECIAL TERMS AND CONDITIONS

1. Termination

- A. Either Party reserves the right to terminate this agreement without cause upon 30 days written notice to the other Party, or immediately in the event of a material breach. In the event of termination, Contractor shall be paid for all allowable costs incurred up to the date of termination, including any non-cancelable obligations.
- B. In the event that the total Agreement amount is expended prior to the expiration date, DPR may, at its sole discretion, terminate this Agreement with 30 days notice to contractor.

2. Subcontracting

Contractor shall perform the work contemplated with resources available within its own organization and no portion of the work shall be subcontracted unless the subcontract(s) is identified in this Agreement.

3. State-Owned Data - Integrity and Security

- A. Contractor shall comply with the following requirements to ensure the preservation, security, and integrity of State-owned data on portable computing devices and portable electronic storage media:
 - 1) Encrypt all State-owned data stored on portable computing devices and portable electronic storage media using government-certified Advanced Encryption Standard (AES) cipher algorithm with a 256-bit or 128-bit encryption key to protect DPR data stored on every sector of a hard drive, including temp files, cached data, hibernation files, and even unused disk space;
 - 2) Data encryption shall use cryptographic technology that has been tested and approved against exacting standards, such as FIPS 140-2 Security Requirements for Cryptographic Modules;
 - 3) Encrypt, as described above, all State-owned data transmitted from one computing device or storage medium to another;
 - 4) Maintain confidentiality of all State-owned data by limiting data sharing to those individuals contracted to provide services on behalf of the State, and limit use of State information assets for State purposes only;
 - 5) Install and maintain current anti-virus software, security patches, and upgrades on all computing devices used during the course of the Agreement;
 - 6) Notify the Contract Manager immediately of any actual or attempted violations of security of State-owned data, including lost or stolen computing devices, files, or portable electronic storage media containing State-owned data; and,
 - 7) Advise the owner of the State-owned data, the agency Information Security Officer, and the agency Chief Information Officer of vulnerabilities that may

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present a threat to the security of State-owned data and of specific means of protecting that State-owned data.

- B. Contractor shall use the State-owned data only for State purposes under this Agreement.
- C. Contractor shall not transfer State-owned data to any computing system, mobile device, or desktop computer without first establishing the specifications for information integrity and security as established for the original data file(s).

4. Dispute Resolution

- A. DPR reserves the right to issue an order to stop work in the event that a dispute should arise, or in the event that DPR gives the performing agency a notice that this Agreement will be terminated. If DPR exercises this right, the stop-work order will be in effect until the dispute has been resolved or this Agreement has been terminated.
- B. Any dispute concerning a question of fact arising under the terms of this Agreement which is not disposed of within a reasonable period of time by agency employees normally responsible for the administration of this agreement, shall be brought to the attention of the Executive Officer or designated representative of each agency for joint resolution.
- C. The Contractor shall continue to perform all its responsibilities under this agreement during any dispute until notified to stop work or expiration of this Agreement.

5. Harassment Free Workplace

The Department of Pesticide Regulation (DPR) is committed to providing a safe, secure environment, free from sexual misconduct. It is policy of the Department that employees have the right to work in an environment that is free from all forms of discrimination, including sexual harassment. This policy specifically speaks to freedom from a sexually harassing act that results in the creation of an intimidating, hostile or offensive work environment or that otherwise interferes with an individual's employment or work performance. As a Contractor with DPR, you and your staff are expected to comply with a standard of conduct that is respectful and courteous to DPR employees and all other persons contacted during the performance of this Agreement. Sexual harassment is unacceptable, will not be tolerated; and may be cause for prohibiting some or all of the Contractor's staff from performing work under this Agreement.

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ADDITIONAL PROVISIONS

1. Disposition of Work Product

DPR retains use and non-commercial governmental distribution rights to all deliverables identified in Exhibit A of this Agreement.

2. Contractor Evaluation

The Contractor is hereby notified that its performance under this Agreement will be evaluated within 30 calendar days following the Expiration of this Agreement. The evaluation may include statements on the adequacy of the service or the product, whether the service was satisfactory, whether the service or the product was provided or completed within the time limitations, reasons for time or cost overruns, whether the product is operational or being utilized by the State, and/or the State plans for implementation, and the State's general impression as to the competency of the Contractor and its staff. The evaluation shall be filed in the State's official Contractor Evaluation File.

3. Consulting Services

- A. The Contractor is hereby advised of its duties, obligations and rights under Public Contract Code § 10335.5.
- B. The Contractor's key personnel assigned to perform work under this Agreement and their level of responsibility shall be mutually acceptable to the State and the Contractor.

EXHIBIT F
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Biographical Sketch for Alexander Aue

Contact Details:

Email : aave@ucdavis.edu
Postal : Department of Statistics, University of California at Davis
4118 Mathematical Sciences Building, One Shields Avenue, Davis, CA 95616

Professional Preparation:

Philipps University Marburg Mathematics 2000 Diplom
University of Cologne Applied Mathematics 2004 Ph.D.

Appointments:

2011 – present Associate Professor, Department of Statistics, University of California at Davis.
2007 – 2011 Assistant Professor, Department of Statistics, University of California at Davis.
2006 – 2007 Assistant Professor, Department of Mathematical Sciences, Clemson University.
2004 – 2006 Assistant Professor (Lecturer), Department of Mathematics, University of Utah.

Five Publications most closely related to the proposed project:

1. Aue, A., Dubart Nourinho, D., and Hörmann, S. (2015), "On the Prediction of Stationary Functional Time Series", *Journal of the American Statistical Association*, 110, 378–392.
2. Liu, H., Aue, A., and Paul, D. (2015), "The Marcenko–Pastur Law for Linear Time Series", *The Annals of Statistics*, 43, 675–712.
3. Dienes, C., and Aue, A. (2014), "On-line Monitoring of Pollution Concentrations with Autoregressive Moving Average Times Series", *Journal of Time Series Analysis*, 35, 239–261.
4. Aue, A., and Horváth, L. (2013), "Structural Breaks in Time Series", *Journal of Time Series Analysis*, 34, 1–16.
5. Aue, A., Hörmann, S., Horváth, L., and Reimherr, M. (2009), "Break Detection in the Covariance Structure of Multivariate Time Series Models", *The Annals of Statistics* 37, 4046–4087.

Five Other Publications:

1. Aue, A., Cheung, R., Lee, T.C.M., and Zhong, M. (2014), "Segmented Variable Selection in Quantile Regression Using the Minimum Description Length Principle", *Journal of the American Statistical Association*, 109, 1241–1256.
2. Wong, R.K.W., Baines, P., Aue, A., Lee, T.C.M., and Kashyap, V.L. (2014), "Automatic Estimation of Flux Distributions of Astrophysical Source Populations", *The Annals of Applied Statistics*, 8, 1690–1712.
3. Aue, A., Horváth, L., and Hušková, M. (2012), "Segmenting Mean-Nonstationary Time Series via Trending Regressions", *Journal of Econometrics*, 168, 367–381.
4. Aue, A., and Lee, T.C.M. (2011), "On Image Segmentation using Information Theoretic Criteria", *The Annals of Statistics* 39, 2912–2935.
5. Aue, A., and Horváth, L. (2011), "Quasi-likelihood Estimation in Stationary and Nonstationary Autoregressive Models with Random Coefficients", *Statistica Sinica* 21 973–999, 2011.

EXHIBIT F
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Synergistic Activities:

- 1 *Teaching and Training:*
Currently advising 6 Ph.D. students. Has taught 11 different statistics and probability courses (7 undergraduate and 4 graduate) at University of California at Davis, Clemson University, and University of Utah.
- 2 *Department and University Service:*
Currently serves as Vice Chair for Undergraduate Affairs and Faculty Undergraduate Advisor at University of California at Davis.
- 3 *Conference Organization:*
Member of the Local Organizing Committee for the NBER-NSF Time Series Meeting 2009 held at the University of California at Davis. Member of the Scientific Program Committee for the IWSM 2009 Meeting held at the University of Technology of Troyes, France.
- 4 *Editorial Service and Refereeing:*
Associate editor for *Journal of the Royal Statistical Society, Series B*, *Journal of Computational and Graphical Statistics* and *Journal of Statistical Planning and Inference*. Served as referee for 20+ journals.
- 5 *Grant Reviews:*
Panelist for National Science Foundation (Division of Mathematical Sciences), Reviewer (Natural Sciences and Engineering Research Council of Canada), Reviewer (Fonds quebécois de la recherche sur la nature et les technologies).
- 6 *Consulting and Advising:*
Has consulting experience in the financial sector and advising experience in the environmental data field (with contacts in Civil Engineering and Atmospheric Science).

Collaborators & Other Affiliations:

- (i) *Collaborators* (in alphabetical order and excluding students)
P. Baines (UC Davis), I. Berkes (Graz University of Technology, Austria), P. Burman (UC Davis), D. Dubart Norinho (City University London, UK), R. Gabrys (Marshall School of Business, University of Southern California), C. Gallagher (Clemson University), S. Hörmann (Université Libre de Bruxelles, Belgium), L. Horváth (University of Utah), C. Hurvich (Stern, New York University), M. Hušková (Charles University Prague, Czech Republic), P. Kokoszka (Colorado State University), T. Lee (University of California at Davis), S. Ling (Hong Kong University of Science and Technology), R. Lund (Clemson University), M. Kühn (Universität zu Köln, Germany), M. Reimherr (University of Chicago), M. Robbins (University of Missouri), P. Soulier (University Paris X, France), J. Steinebach (Universität zu Köln, Germany), H. Wang (Colorado State University)
- (ii) *Thesis Advisors*
Josef Steinebach (University of Cologne) and Lajos Horváth (University of Utah)
- (iii) *List of advisees and co-advisees* (12 in total)
Ozan Sonmez, Ph.D. (expected 2018); Jamshid Namdari, Ph.D. (expected 2018); Haoran Li, Ph.D. (expected 2017); Rick Wang, Ph.D. (expected 2017); Rex Cheung, Ph.D. (expected 2016); Haoying Meng, Ph.D. (expected 2015); Haoyang Liu, Ph.D. (2013); Christopher Diones, Ph.D. (2013); Kimihiro Noguchi, Ph.D. (2013); Ming Zhong, Ph.D. (2012); Lu Wang, Ph.D. (2012); Tharanga Wickramarachchi, MS (2008, Clemson University)

Personnel							Reference Info			Escalation:		3%
Name/Role:	Base Salary	% Annual Effort			Type	/12	Eseal	Period 1	Period 2	Period 3	Total	
								10/1/15-9/30/16	10/1/16-9/30/17	10/1/17-9/30/18	10/1/15-12/31/18	
1 Alex Aue - PI	98,255	11.00%	11.00%	33.00%	AY	9		10,889	11,216	34,657	56,762	
2 GSR - Step IV	45,300	12.50%	12.50%	12.50%				5,705	5,876	6,052	17,633	
3 GSR - Step IV	45,300	12.50%	12.50%	12.50%				5,705	5,876	6,052	17,633	
4 GSR - Step IV	45,300	12.25%						5,591	0	0	5,591	
Total Salaries								27,890	22,968	46,761	97,619	

Benefits by Person	Split:	9/3	9/3	9/3	3/0	0/0	Period 1	Period 2	Period 3	Total
	Code	%	%	%	%	%				
1 Alex Aue - PI	F-SMRA	17/18	18/18.5	18.5/19.1	19.1	0	1,905	2,047	6,584	10,536
2 GSR - Step IV	G	1.3	1.3	1.3	1.3		75	76	79	230
Total Benefits							1,980	2,123	6,663	10,766
Total Personnel							29,870	25,091	53,424	108,385

Equipment	Total
	0
Total Equipment	0

Travel	International?			Total
	No			
	1,000	1,000	1,000	3,000
Total Travel	1,000	1,000	1,000	3,000

Supplies and Minor Equipment	Total
Laptop	2,000
Total Supplies and Minor Equipment	2,000

Other Expenses										Period 1	Period 2	Period 3	Total
GSR Tuition/Fees										Total GSR Tuition/Fees:			
Resident	Provost's Discount?	Eseal %	Type	Current \$	Yr1	Yr2	Yr3	Yr4	Yr5	4,672	0	0	4,672
Resident		10%	AY	17,162	0.33					4,672	0	0	4,672
Non-Resident	Yes	10%		32,264						0	0	0	0
Other (e.g. filing status)		10%		8,581						0	0	0	0
Total Other Direct Costs										4,672	0	0	4,672

Total Direct Costs								37,542	26,091	54,424	118,057
Indirect Cost Base								Rate Type: Other: (Enter Info Below)			
Indirect Costs								Base Type: MTDC		Rate (%): 25%	
Total Costs (Direct + Indirect)								\$45,760	\$32,614	\$68,930	\$146,404